

Distribution map is not currently available

MERISTIC CHARACTERS**BONY PARTS (min-mode-max)****Vertebrae**

Total: 28 - X - 31
 Precaudal: 11 - 12 - 12
 Caudal: 16 - X - 19

Gill Rakers & Branchiostegal Rays

Upper gill rakers: 4¹ - X - 6
 Lower gill rakers: 13¹ - X - 18
 Branchiostegal rays: 8 - 8 - 8

FIN COUNTS (min-mode-max)

Fin (Position)	Spine(s)	Ray(s)
Pelvic (Thoracic)	1 - 1 - 1	7 - 7 - 7
Dorsal	3 - 3 - 3	13 ¹ - 15 - 16
Pectoral	N/A	14 ¹ - 16 - 17
Anal	1 - 1 - 1	7 - 8 - 9

Caudal Fin Counts

Caudal upper secondary: 3 - 4 - 5¹
 Caudal upper principal: 10 - 10 - 10
 Caudal lower principal: 9 - 9 - 9
 Caudal lower secondary: 3 - X - 5¹

LIFE HISTORY FEATURES**GENERAL**

Range: Bering Sea, 54 to 66 °N - South of southern California
Ecology: Mesopelagic, 200-1000 m
ELH Pattern: Oviparous, pelagic eggs, pelagic larvae
Longevity:

SPAWNING

Area:
Season:
Mode:
Fecundity:
Age at first maturity:
Migration:

EARLY LIFE HISTORY DESCRIPTION**EGGS**

Diameter (mm): 0.81 - 0.96
No. of oil globules: 1
Oil globule diameter:
Yolk: Segmented
Chorion: Clear, spherical
Egg/Embryo pigment: head, yolk, dorsal, ventral
Pigment diagnostics:
Diagnostics:

LARVAE

Hatch size(mm SL): 2
Preanal length(%SL): 45-55
Flexion length (mm SL): ~6
Length at transformation (mm SL):
Fin ray development sequence: Pelvics, dorsal and caudal, anal, pectorals

Larval Pigment Patterns

In each developmental larval stage, pigment is present in the regions listed below. For pigment regions see Figure 6.

Yolk-sac: yolk, mouth, crown, dorsal gut, lateral gut, dorsal, ventral

Preflexion: crown, nape, dorsal gut, lateral gut, ventral gut, dorsal finfold, dorsal, ventral

Flexion: crown, nape, dorsal gut, lateral gut, ventral gut, dorsal, ventral, caudal

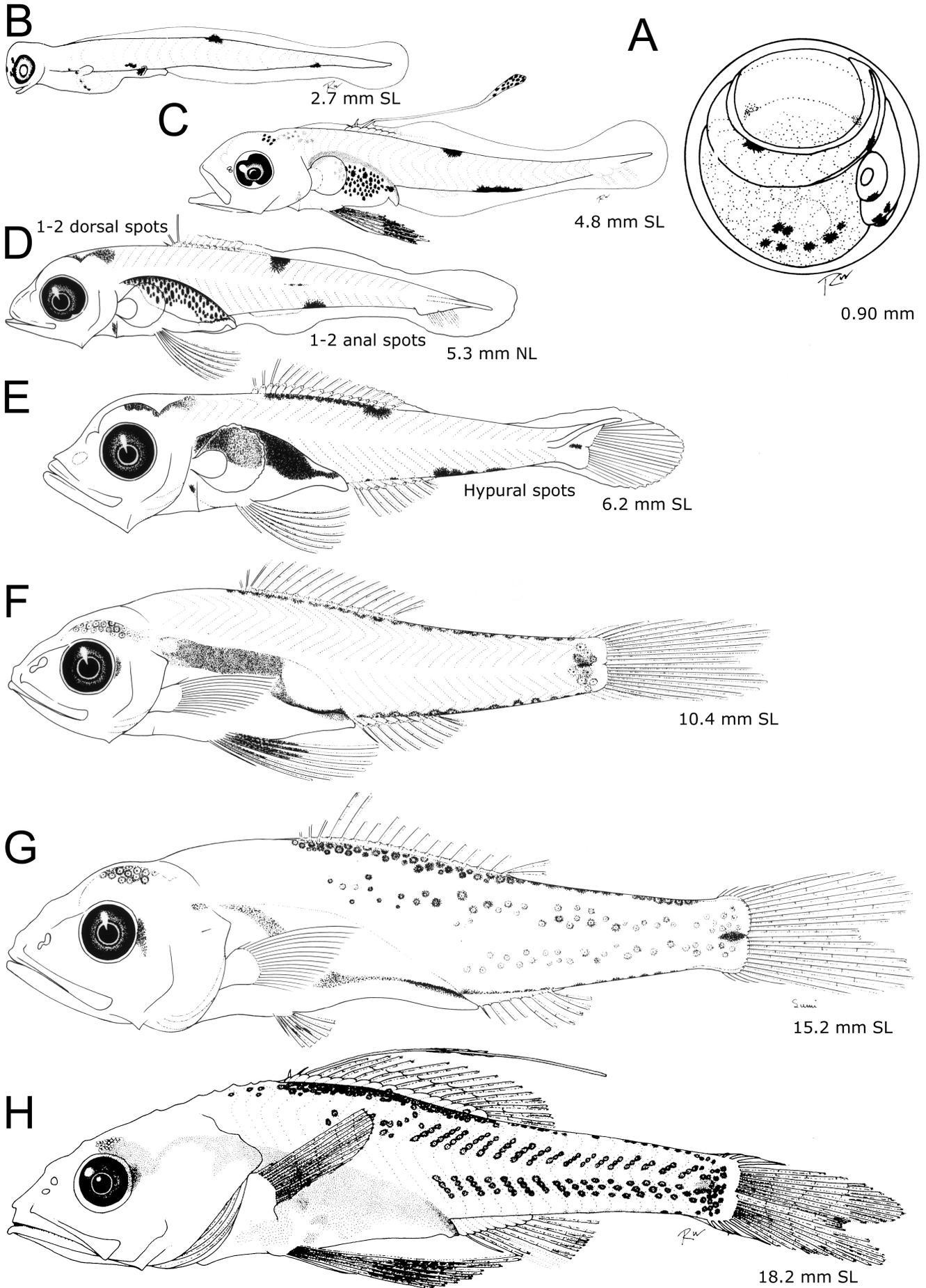
Postflexion: crown, cheek, dorsal gut, lateral gut, ventral gut, dorsal, ventral, mediolateral, caudal

Juvenile:

Pigment Diagnostics: Pigment always present on dorsal and ventral margins; when present, pigment usually on proximal half of pelvic fin after 6 mm and covers the entire fin after 16 mm; distinguished from *Sebastes* spp. at sizes < 5 mm SL by: postanal pigment band more anterior, beginning at myomere 15

Diagnostics

Pigment patches and bands; 2nd or 3rd dorsal ray elongate (until 5-10 mm SL); pelvics develop rapidly (2-10 mm SL) and are long, fragile, and pigmented; distinguished from *Sebastes* spp. at sizes < 5 mm SL by: postanal pigment band more anterior (beginning at myomere 15), precocious development of pelvic fin



GENERAL REFERENCES**Ref 1: Keene, M.J., and K.A. Tighe. 1984.**

Beryciformes: Development and relationships. In H.G. Moser, W.J. Richards, D.M. Cohen, M.P. Fahay, A.W. Kendall, Jr., and S.L. Richardson (eds.), Ontogeny and systematics of fishes. Spec. Publ. 1, Am. Soc. Ichthyol. Herpetol., p. 383-392. Allen Press, Lawrence, KS, 760 p.

Ref 2: Matarese, A.C., A.W. Kendall, Jr., D.M. Blood, and B.M. Vinter. 1989.

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Melamphaidae: Bigscales. In H.G. Moser (ed.), The early stages of fishes in the California Current region, p. 692-711. CalCOFI Atlas 33. Allen Press, Lawrence, KS, 1505 p.

FOOTNOTES**¹ Ebeling, A.W. 1962.**

Melamphaidae. I. Systematics and zoogeography of the species in the bathypelagic fish genus *Melamphaes* Gunther. Dana-Rep. Carlsberg Found. 58, 164 p.

FIGURES**A - C, H: Sandknop, E.M., and W. Watson. 1996.**

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D - G: Keene, M.J., and K.A. Tighe. 1984.

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MERISTIC CHARACTERS**BONY PARTS (min-mode-max)****Vertebrae**

Total: 26 - 27 - 29
 Precaudal: 10 - 10 - 10
 Caudal: 16 - 17 - 19

Gill Rakers & Branchiostegal Rays

Upper gill rakers: 8 - 9 - 12
 Lower gill rakers: 18 - X - 24
 Branchiostegal rays: 8 - 8 - 8

FIN COUNTS (min-mode-max)

Fin (Position)	Spine(s)	Ray(s)
Pelvic (Thoracic)	1 - 1 - 1	7 - 7 - 8
Dorsal	3 - 3 - 3	11 - 12 - 14
Pectoral	N/A	13 - 14 - 15
Anal	1 - 1 - 1	8 - 9 - 11

Caudal Fin Counts

Caudal upper secondary: 4 - 4 - 4
 Caudal upper principal: 10 - 10 - 10
 Caudal lower principal: 9 - 9 - 9
 Caudal lower secondary: 4 - 4 - 4

LIFE HISTORY FEATURES**GENERAL**

Range: Bering Sea, 54 to 66 °N - South of southern California
Ecology: Meso- and bathypelagic, 150-1200 m
ELH Pattern: Oviparous, pelagic eggs, pelagic larvae
Longevity:

SPAWNING

Area:
Season:
Mode:
Fecundity:
Age at first maturity:
Migration:

EARLY LIFE HISTORY DESCRIPTION**EGGS**

Diameter (mm):
No. of oil globules:
Oil globule diameter:
Yolk:
Chorion:
Egg/Embryo pigment:
Pigment diagnostics:
Diagnostics:

LARVAE

Hatch size(mm SL): 3
Preanal length(%SL): 33-66
Flexion length (mm SL): 7.2-7.3 through 9.9-10.7
Length at transformation (mm SL): ~18 through 21.2-21
Fin ray development sequence: Pelvics, pectorals, principal caudal and dorsal, procurrent caudal and anal

Larval Pigment Patterns

In each developmental larval stage, pigment is present in the regions listed below. For pigment regions see Figure 6.

Yolk-sac: pectoral fin

Preflexion: crown, dorsal gut, lateral gut, caudal finfold, pectoral fin, ventral, caudal

Flexion: mouth, crown, cheek, isthmus, dorsal gut, lateral gut, anal finfold, caudal finfold, pectoral fin, dorsal, ventral, mediolateral, caudal

Postflexion: mouth, crown, nape, cheek, isthmus, dorsal gut, lateral gut, dorsal finfold, caudal finfold, pectoral fin, dorsal, ventral, mediolateral, caudal

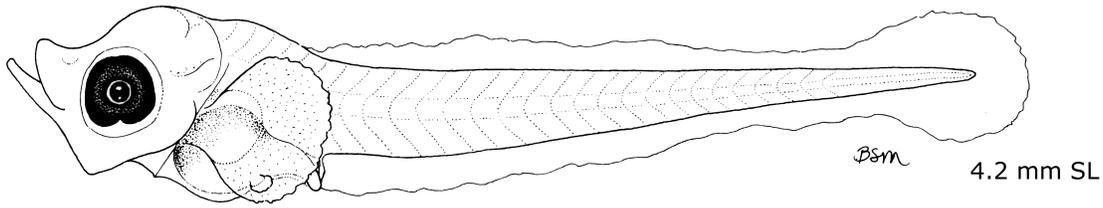
Juvenile:

Pigment Diagnostics: Large pigmented pectoral and pelvic fins

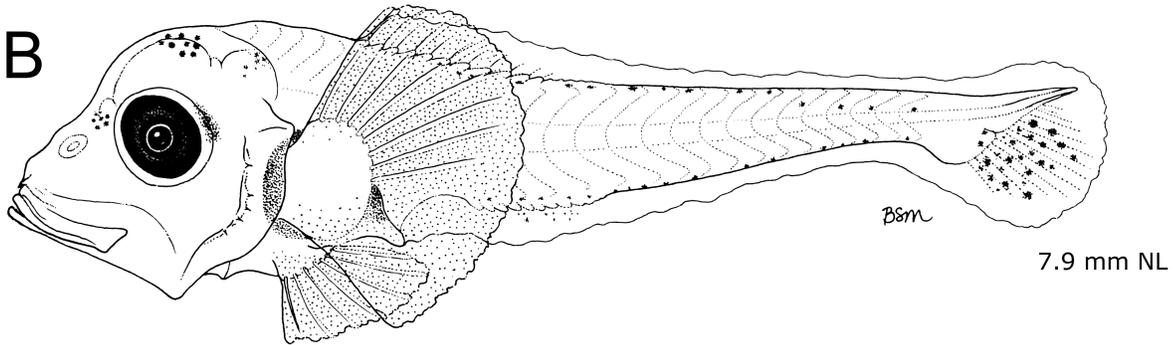
Diagnostics

Preopercular, opercular, and posttemporal spines form during flexion stage; frontal, pterotic, and nasal spines form early in postflexion stage; eyes become relatively small; large pigmented pectorals and pelvics

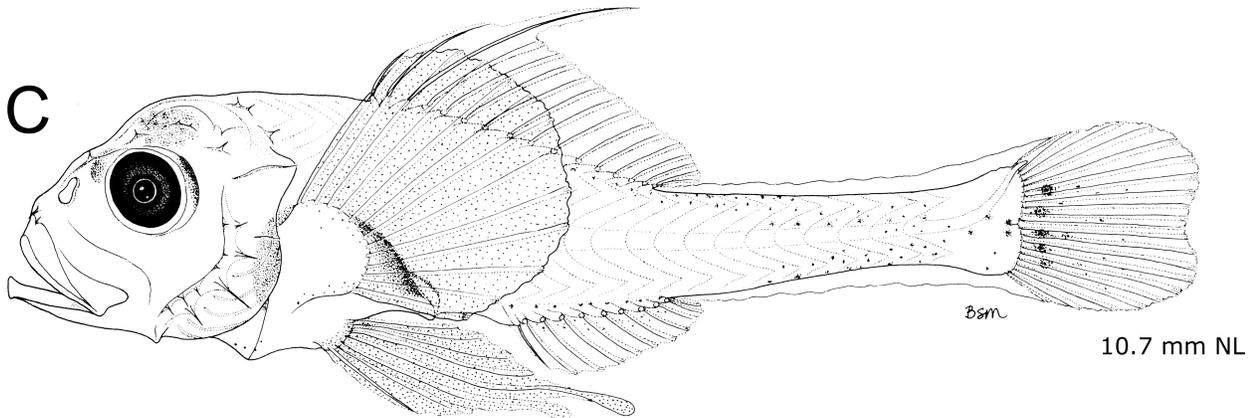
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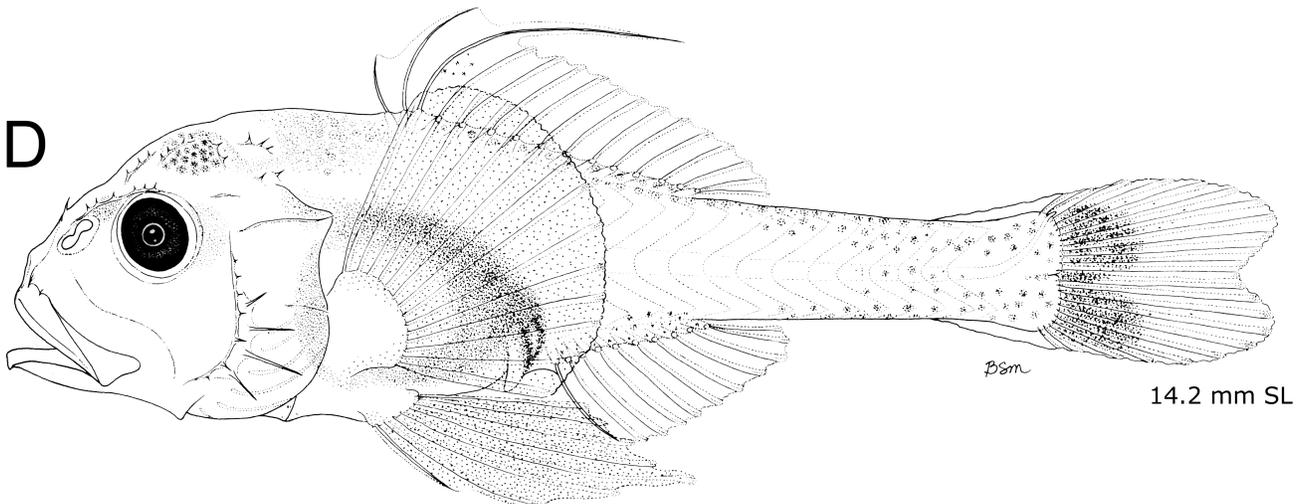
B



C



D



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MERISTIC CHARACTERS**BONY PARTS (min-mode-max)****Vertebrae**

Total: 23 - 25 - 27
 Precaudal: 10 - 10 - 11
 Caudal: 14 - 15 - 16

Gill Rakers & Branchiostegal Rays

Upper gill rakers: 5 - 6 - 7
 Lower gill rakers: 15 - 16 - 19
 Branchiostegal rays: 8 - 8 - 8

FIN COUNTS (min-mode-max)

Fin (Position)	Spine(s)	Ray(s)
Pelvic (Thoracic)	1 - 1 - 1	7 - 7 - 8
Dorsal	2 - 2 - 3	10 - X - 13
Pectoral	N/A	12 - X - 14
Anal	1 - 1 - 1	7 - X - 9

Caudal Fin Counts

Caudal upper secondary: 3 - 4 - 5
 Caudal upper principal: 10 - 10 - 10
 Caudal lower principal: 9 - 9 - 9
 Caudal lower secondary: 3 - 3 - 5

LIFE HISTORY FEATURES**GENERAL**

Range: Bering Sea, 54 to 66 °N - South of southern California
Ecology: Mesopelagic, 200 to 1200 m
ELH Pattern: Oviparous, pelagic eggs, pelagic larvae
Longevity:

SPAWNING

Area:
Season:
Mode:
Fecundity:
Age at first maturity:
Migration:

EARLY LIFE HISTORY DESCRIPTION**EGGS**

Diameter (mm):
No. of oil globules:
Oil globule diameter:
Yolk:
Chorion:
Egg/Embryo pigment:
Pigment diagnostics:
Diagnostics:

LARVAE

Hatch size(mm SL): 2.2
Preanal length(%SL): 43-70
Flexion length (mm SL): 3.3-3.4 through 4.1
Length at transformation (mm SL): ~10.5 through 12.6-14.3
Fin ray development sequence: Pelvics, dorsal, anal and principal caudal, pectorals, procurrent caudal

Larval Pigment Patterns

In each developmental larval stage, pigment is present in the regions listed below. For pigment regions see Figure 6.

Yolk-sac:

Preflexion: crown, dorsal gut, dorsal, ventral, mediolateral, caudal

Flexion: crown, dorsal gut, dorsal, ventral, mediolateral, caudal

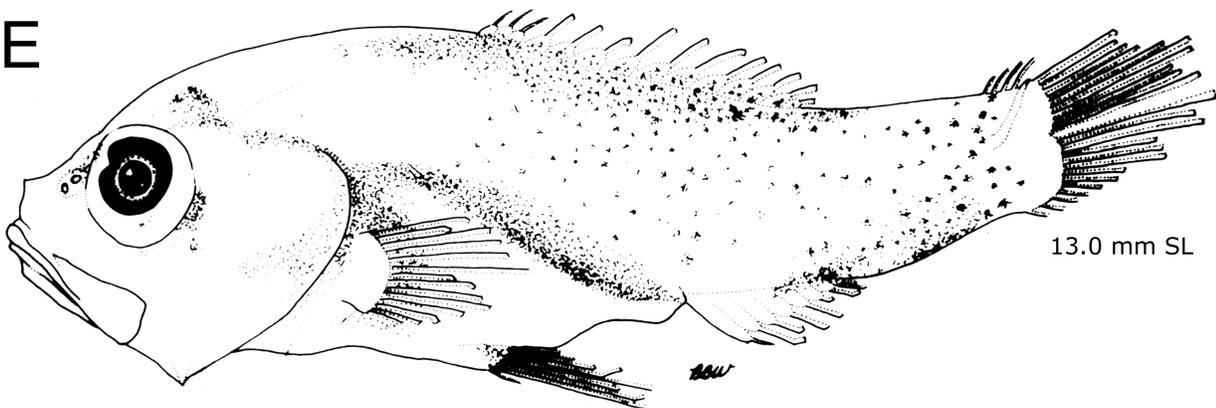
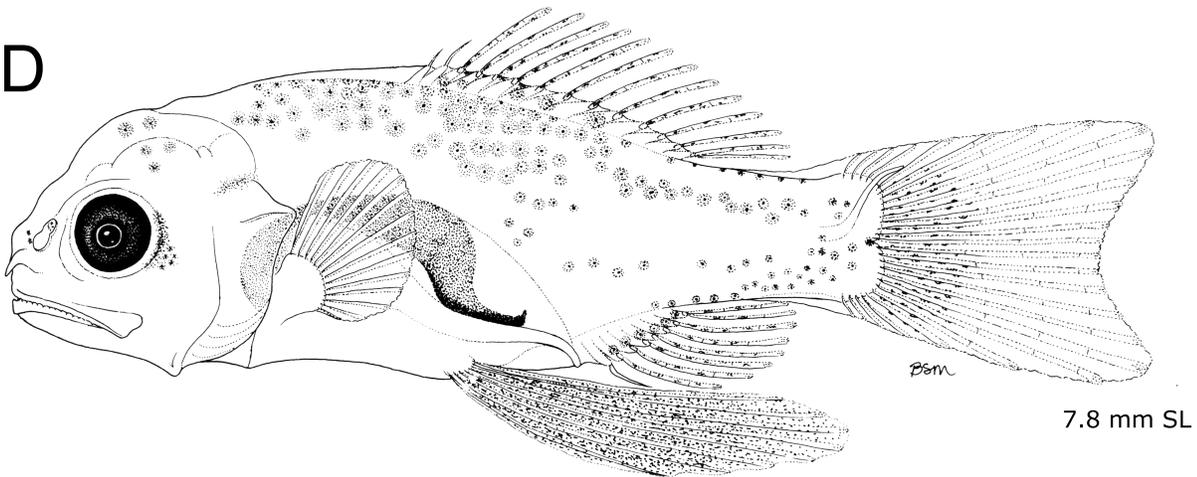
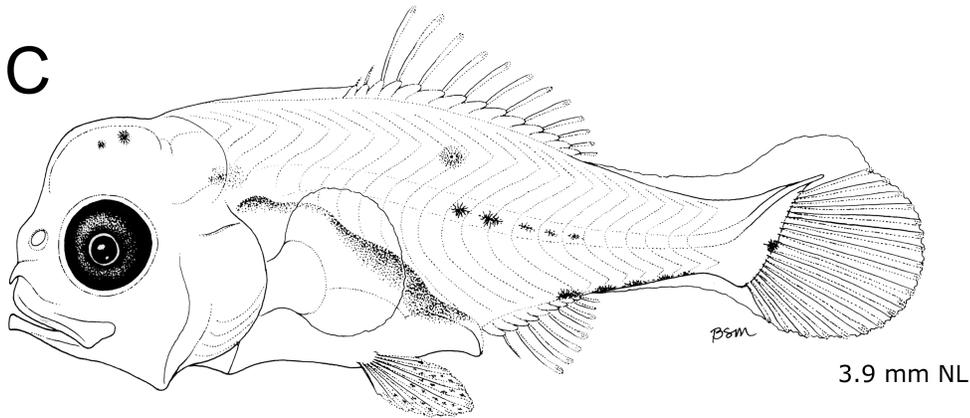
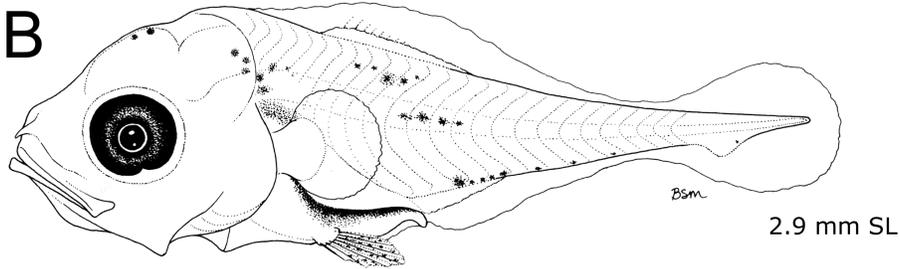
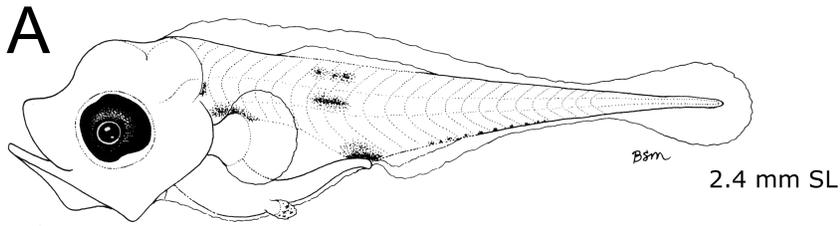
Postflexion: mouth, crown, nape, cheek, dorsal gut, lateral gut, dorsal finfold, anal finfold, caudal finfold, dorsal, ventral, mediolateral, caudal

Juvenile:

Pigment Diagnostics: Trunk and tail pigment form discontinuous diagonal bar at midbody

Diagnostics

Lack of preopercular spines, prominent hook-like projection present at anterior end of maxillary, precocious pelvic formation, robust form, flexion and transformation at small size, trunk and tail pigment form discontinuous diagonal bar at midbody



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